

REMARKS

By this amendment, claim 4 remains canceled. Claims 1 and 9 have been amended. Claims 1-3 and 5-10 remain in the application. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, and allowance of the application, as amended, is requested.

Rejection under 35 U.S.C. §103

Claim 1:

Claim 1 recites an audio conditioning apparatus for conditioning an audio signal to be output, said audio conditioning apparatus comprising:

- an input for receiving the audio signal;

- a noise characterizing unit for determining a noise level of environmental noise in a mid-range frequency noise band;

- a volume amplification unit coupled to said input for amplifying a volume of the audio signal for all frequencies of the audio signal by a volume gain in dependence on the noise level in the mid-range frequency noise band;

- a further noise characterizing unit for determining a further noise level of the environmental noise in a bass frequency noise band or a treble frequency noise band; and

- a further amplification unit coupled to said volume amplification unit for amplifying by a further gain the amplitude of frequency components in a bass frequency audio band or a treble frequency audio band of the audio signal, in dependence of the further noise level of the environmental noise in the base or treble frequency band, respectively, to perceptually mask the environmental noise in the base frequency noise band or the treble frequency noise band from a respective base frequency or treble frequency audio band of the volume amplified audio signal,

- wherein said mid-range frequency noise band being complementary to said

base frequency noise band and said treble frequency noise band, covering frequencies not in said base frequency noise band and said treble frequency noise band, and wherein said audio conditioning apparatus further comprises:
a gain dispatcher unit coupled to said input for allocating a maximum allowable gain of the volume amplification unit and the further amplification unit on the basis of available headroom for amplification.

Support for amendment to claim 1 (as well as for amendment to claim 9) can be found in the specification at least on page 2, lines 11-21 and 27-29; page 3, line 34 to page 4, line 4; page 12, lines 11-12; and FIGs. 1 and 5.

As presented, claim 1 clearly articulates a novel and non-obvious audio conditioning apparatus for advantageously conditioning an audio signal to mask the noise in perceptually allowable frequency bands, namely bass and/or treble bands. In addition, the mid-range frequency noise band is complementary to the base frequency noise band and the treble frequency noise band, covering frequencies not in the base frequency noise band *and* the treble frequency noise band (See, for example, the present specification on page 2, lines 11-21). Furthermore, noise is advantageously measured for approximately the same frequencies which are conditioned in the audio, e.g., the frequency range of the base frequency *noise* band and the base frequency *audio* band is substantially similar. In one embodiment, only the bass will be emphasized, which perceptually does not sound like a (bass) volume increase, but rather as a decrease of the bass frequency noise. In other words, the audio signal is more clearly audible over the environmental noise. (See, for example, the present specification on page 3, lines 12-15). In addition, the perceptual result of the audio conditioning is not so much a volume increase, but rather a masking of the environmental noise. Furthermore, the environmental noise measured in the mid-range band of frequencies is not used to amplify the amplitude of mid-range components in

the audio signal, but to adjust the volume of the audio signal (i.e., equal for all frequencies). In other words, the *volume* of the audio signal for all frequencies is amplified as a function of a determined noise level in the mid-range frequency noise band alone. Moreover, only *after* the audio signal has been volume amplified (i.e., by a volume gain in dependence on the noise level in the mid-range frequency noise band alone) is the amplitude of the *audio* signal in one or more base band and/or treble band modified for perceptual masking of the noise in the respective bands. See, for example, the present specification on page 3, line 34 to page 4, line 6 and FIGs. 1 and 5).

Claims 1-2 and 8-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., U.S. Patent 5434926 ("**Watanabe**") in view of Hermann, U.S. Patent 6360187 B1 ("**Hermann**"). With respect to claim 1, Applicant respectfully traverses this rejection on the grounds that the references are defective in establishing a prima facie case of obviousness.

As the PTO recognizes in MPEP § 2142:

... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness ...

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for at least the following reasons.

1. Even When Combined, the References Do Not Teach the Claimed Subject Matter

The **Watanabe** and **Hermann** references cannot be applied to reject claim 1 under 35 U.S.C. §103 which provides that:

A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which the subject matter pertains ... (Emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither **Watanabe** nor **Hermann** teaches an audio conditioning apparatus featuring "a volume amplification unit coupled to ... [an audio signal] input for amplifying a volume of the audio signal for *all* frequencies of the audio signal by a volume gain *in dependence on* the *noise level* in the *mid-range frequency noise band* ... a further amplification unit coupled to said volume amplification unit for amplifying by a further gain the amplitude of frequency components in a bass frequency audio band or a treble frequency audio band of the audio signal, in dependence of the further noise level of the environmental noise in the base or treble frequency band, respectively, to perceptually mask the environmental noise in the base frequency noise band or the treble frequency noise band from a respective base frequency or treble frequency audio band of the volume amplified audio signal, wherein said *mid-range frequency noise band* being *complementary to* said *base frequency noise band* and said *treble frequency noise band*, covering frequencies not in said *base frequency noise band* and said *treble frequency noise band*" (emphasis added) as is claimed in claim 1, it is impossible to render the subject matter of claim 1 as a whole obvious, and the explicit terms of the statute cannot be met.

In contrast, the **Watanabe** reference is directed to an automatic sound volume control method in which a volume correcting value inferring portion obtains inference results of individual control rules on the basis of individual frequency band component levels L, M, H input from a filter circuit and the volume level input from an audio reproducing portion ... to automatically correct a volume of an audio signal AS. (See Watanabe abstract and FIG. 2). In addition, **Watanabe** teaches the passband of the intermediate-pass filter **12b** is the intermediate and low frequencies having frequency characteristics relatively close to those of road noises" (*emphasis added*, see Watanabe at column 3, lines 50-53). Accordingly, the **Watanabe** reference does not teach or

suggest "a volume amplification unit coupled to ... [an audio signal] input for amplifying a volume of the audio signal for *all* frequencies of the audio signal by a volume gain *in dependence on* the *noise level* in the *mid-range frequency noise band* ... a further amplification unit coupled to said *volume amplification unit* for amplifying by a further gain the amplitude of frequency components in a bass frequency audio band or a treble frequency audio band of the audio signal, in dependence of the further noise level of the environmental noise in the base or treble frequency band, respectively, to perceptually mask the environmental noise in the base frequency noise band or the treble frequency noise band from a respective base frequency or treble frequency audio band of the volume amplified audio signal, wherein said *mid-range frequency noise band* being complementary to said *base frequency noise band* and said *treble frequency noise band*, covering frequencies not in said *base frequency noise band* and said *treble frequency noise band*" as recited in claim 1.

In further contrast, the **Hermann** reference is directed to an ambient adjusted volume control for in-vehicle messages. The **Hermann** reference discloses a sound level calibration table that provides priority gain values for setting the programmable gain of a gain controller to ensure that messages are reproduced at a sound level which is relatively greater than ambient noise level by a predetermined difference which is consistent for all levels of ambient noise (see Hermann abstract). However, the **Hermann** reference does not teach or suggest "a volume amplification unit coupled to ... [an audio signal] input for amplifying a volume of the audio signal for *all* frequencies of the audio signal by a volume gain *in dependence on* the *noise level* in the *mid-range frequency noise band* ... a further amplification unit coupled to said *volume amplification unit* for amplifying by a further gain the amplitude of frequency components in a bass frequency audio band or a treble frequency audio band of the audio signal, in dependence of the further noise level of the environmental noise in the base or treble frequency band, respectively, to perceptually mask the environmental noise in the base frequency noise band or the treble frequency noise band from a respective base

frequency or treble frequency audio band of the volume amplified audio signal, wherein said *mid-range frequency noise band* being *complementary* to said *base frequency noise band* and said *treble frequency noise band*, covering frequencies not in said *base frequency noise band* and said *treble frequency noise band*" as recited in claim 1.

For this reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

2. Prior Art That Teaches Away From the Claimed Invention Cannot be Used to Establish Obviousness

In the present case, the **Watanabe** reference, by providing that the "passband of the intermediate-pass filter **12b** is the intermediate and low frequencies" (see Watanabe at column 3, lines 50-53), is directed to a method in which a *mid-range frequency noise band* covers frequencies in the *base frequency noise band*. Accordingly, the intermediate band of **Watanabe** is not "*complementary to a base frequency noise band and a treble frequency noise band*, covering frequencies not in said *base frequency noise band* and said *treble frequency noise band*." Thus, the method of **Watanabe** clearly teaches away from claim 1, recited above.

Since it is well recognized that teaching away from the claimed invention is a *per se* demonstration of lack of *prima facie* obviousness, it is clear that the examiner has not borne the initial burden of factually supporting any *prima facie* conclusion of obviousness.

Thus, for this reason alone, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

3. The Combination of References is Improper

Assuming, arguendo, that the above argument for non-obviousness does not apply (which is clearly not the case based on the above), there is still another compelling reason why the **Watanabe** and **Hermann** references cannot be applied to reject claim 1 under 35 U.S.C. §103.

§ 2142 of the MPEP also provides:

...the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant's disclosure, refrain from using hindsight, and consider the subject matter claimed 'as a whole'.

Here, neither **Watanabe** nor **Hermann** teaches, or even suggests, the desirability of the combination since no one of the references teach an audio conditioning apparatus featuring "a volume amplification unit coupled to ... [an audio signal] input for amplifying a volume of the audio signal for *all* frequencies of the audio signal by a volume gain *in dependence on the noise level in the mid-range frequency noise band* ... a further amplification unit coupled to said volume amplification unit for amplifying by a further gain the amplitude of frequency components in a bass frequency audio band or a treble frequency audio band of the audio signal, in dependence of the further noise level of the environmental noise in the base or treble frequency band, respectively, to perceptually mask the environmental noise in the base frequency noise band or the treble frequency noise band from a respective base frequency or treble frequency audio band of the volume amplified audio signal, wherein said *mid-range frequency noise band* being complementary to said *base frequency noise band* and said *treble frequency noise band*, covering frequencies not in said *base frequency noise band* and said *treble frequency noise band*" as specified above and as claimed in claim 1.

Thus, it is clear that none of the references provides any incentive or motivation

supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. §103 rejection.

In this context, the MPEP further provides at § 2143.01:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In the present case it is clear that the combination presented in the Office Action arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 1. Therefore, for this reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested. Claims 2 and 8 depend from and further limit allowable independent claim 1 and therefore are allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome. Withdrawal of the rejection is respectfully requested.

Claim 9 contain limitations similar to those of claim 1. Accordingly, for similar reasons as stated with respect to overcoming the rejection of claim 1, claim 9 is believed allowable and an early formal notice thereof is requested. Claim 10 depends from and further limits allowable independent claim 9 and therefore is allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome. Withdrawal of the rejection is respectfully requested.

Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., U.S. Patent 5434926 ("**Watanabe**") in view of Hermann, U.S. Patent 6360187 B1 ("**Hermann**") as applied to claim 1, and further in view of Kuusama, U.S. Patent 5509081 ("**Kuusama**"). Applicant respectfully traverses this rejection for at least the following reason. Claim 3 depends from and further limits allowable independent claim 1 and therefore is allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., U.S. Patent 5434926 ("**Watanabe**") in view of Hermann, U.S. Patent 6360187 B1 ("**Hermann**") as applied to claim 1, and further in view of Bohn, U.S. Patent 5046105 ("**Bohn**"). Applicant respectfully traverses this rejection for at least the following reason. Claim 5 depends from and further limits allowable independent claim 1 and therefore is allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome.

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., U.S. Patent 5434926 ("**Watanabe**") in view of Hermann, U.S. Patent 6360187 B1 ("**Hermann**") as applied to claim 1, and further in view of Takahashi et al., U.S. Patent 6891954 ("**Takahashi**"). Applicant respectfully traverses this rejection for at least the following reason. Claim 6 depends from and further limits allowable independent claim 1 and therefore is allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome.

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., U.S. Patent 5434926 ("**Watanabe**") in view of Hermann, U.S. Patent 6360187 B1 ("**Hermann**") and Takahashi et al., U.S. Patent 6891954 ("**Takahashi**") as applied to claim 6, and further in view of Philipsson et al., U.S. Patent 7006624 B1

("Philipsson"). Applicant respectfully traverses this rejection for at least the following reason. Claim 7 depends from and further limits claim 6, which depends from allowable independent claim 1 and therefore is allowable as well. The 35 U.S.C. §103(a) rejection thereof has now been overcome.

Conclusion

Except as indicated herein, the claims were not amended in order to address issues of patentability and Applicants respectfully reserve all rights they may have under the Doctrine of Equivalents. Applicants furthermore reserve their right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or a continuation application.

It is clear from all of the foregoing that independent claims 1 and 9 are in condition for allowance. Claims 2-3 and 5-8 depend from and further limit claim 1 and therefore are allowable as well. Claim 10 depends from and further limits claim 9 and therefore allowable as well.

The amendments herein are fully supported by the original specification and drawings; therefore, no new matter is introduced. An early formal notice of allowance of claims 1-3 and 5-10 is requested.

Respectfully submitted,

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